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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,089	05/09/2001	Jong-Woon Oh	SEC.837	2769
7590	10/24/2003		EXAMINER	
JONES VOLENTINE, L.L.C. Suite 150 12200 Sunrise Valley Drive Reston, VA 20191			COLE, LAURA C	2
			ART UNIT	PAPER NUMBER
			1744	

DATE MAILED: 10/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/851,089	OH ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Laura C Cole	1744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 29 August 2003.

2a) This action is **FINAL**.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) 8-13 and 15 is/are allowed.

6) Claim(s) 1-7 and 14 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 09 May 2001 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application):

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.

4) Interview Summary (PTO-413) Paper No(s). 6.

5) Notice of Informal Patent Application (PTO-152)

6) Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1, 2, and 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Maekawa et al., USPN 5,868,866.

Maekawa et al. disclose a method and apparatus for cleaning a workpiece that comprises a pure water supply (supplied by injectors, Column 4 Lines 6-12), first and second injectors that direct pure water onto a wafer (Figure 2 (20) and (20a) are two injectors, wafer (W)), first and second nozzles attached to ends of the injectors (nozzles are end portion of (20) and (20a) of where the liquid is ejected), a brush (Figure 2 (34) that has a horizontal movement (Figure 2 (B and D)), a brush arm (Figure 2 (32)), the first injector ejects the water to an upper position of the wafer towards the center (Column 4 Line 65 to Column 5 Line 4), and the second injector is disposed adjacent (adjacent is defined as close to or lying near according to The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton

Mifflin Company) the brush (Figure 2). Maekawa et al. further discloses that the second nozzle is perpendicular to a top surface of the wafer (Figure 2), that the brush arm is movable in a vertical direction which is also in a direction parallel to the linear orientation of the first injector (see directional arrow C), the brush moves perpendicularly with respect to the direction along which the first injector extends (see directional arrows B and D).

2. Claims 1, 5-6 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishimura et al., USPN 5,829,087 (herein referred to as '087).

'087 discloses a substrate cleaning apparatus wherein there are first and a plurality of second injectors (Figure 2, first injectors are the "upper" cluster of (6) and the second injectors are the "lower" cluster of (6)) that supply deionized (pure) water (Column 5 Lines 50-53), first and a plurality of second nozzles (nozzles are the end portions of (6) that direct pure water onto a wafer (W), a brush (Figure 1 (8)), a brush arm (Figures 1 and 2 (7)), the first and second injectors eject pure water on an upper position (Figures 1 and 2) and towards the center of the wafer (Column 5 Lines 50-53), where the second injectors are adjacent to the brush (Figure 2) (adjacent is defined as close to or lying near according to The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton Mifflin Company). The second nozzle(s) are disposed to face the top surface of the wafer (as displayed in Figures 1 and 2), the brush moves horizontally according to the hidden lines of Figure 2. The second injectors appear to be of a plurality of "pipe lines" as seen in Figure 2 to be cylindrical pipes). The first injector extends along a radial direction from an edge of the

wafer towards a center of the wafer and ejects the water onto a central portion (Column 5 Lines 50-53; Figure 2). The brush arm is movable in a vertical direction to keep the brush a desired distance from the surface of the wafer and in contact with a surface of the wafer (Abstract; linear actuator setup in Figure 19).

3. Claims 1-6 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Nishimura et al., USPN 6,286,525 (herein referred to as '525).

'525 discloses a substrate cleaning apparatus wherein there are first and a plurality of second injectors (Figure 2, first injectors are the "left" cluster of (6) and the second injectors are the "right" cluster of (6)) that supply deionized (pure) water (Column 5 Lines 8-11; or maybe be the injectors shown in Figures 12-18 (30) and (20)), first and a plurality of second nozzles (nozzles are the end portions of (6) that direct pure water onto a wafer (W) or the end portions of (20) and (30)), a brush (Figure 1 (8); Figures 12-18 (8)), a brush arm (Figures 1 and 2 (7); or element stemming from 8 and connecting it to (7)), the first and second injectors eject pure water on an upper position toward the center of the wafer (Figures 1, 2, and 12-18), where the second injectors are adjacent to the brush (Figure 2 and 12-18). The second nozzle(s) are disposed to face and to be perpendicular the top surface of the wafer (as displayed in the Figures), the first injector is arranged perpendicular to the second injector(s) (as displayed in Figure 2 or in Figure 13B or in Figure 16), the brush moves horizontally according to the hidden lines and arrows of Figures 2, 12-14A, and 16. The brush arm (7) is movable in a vertical direction to keep the brush a desired distance from the surface of the wafer or in contact with the surface of the wafer (Column 6 Lines 4-10). The second injectors

appear to be of a plurality of "pipe lines" as seen in Figure 2 to be cylindrical pipes. Further, the first injector extends along a radial direction from an edge of the wafer toward the center of the wafer (in use.) See also Column 7 Line 55 to Column 8 Line 37.

***Allowable Subject Matter***

4. Claims 8-13 and 15 are allowed.
5. The following is a statement of reasons for the indication of allowable subject matter:

None of the prior art made of record includes a plurality of second injectors that comprise a plurality of pipe lines *formed along the circumference* of the brush arm.

***Applicants Arguments***

6. In the response filed 29 August 2003, Paper No. 5, Applicant contends that:
  - A. Konishi does not include that the second injector is disposed along one side of the brush arm.
  - B. Konishi moves in an arc to place it into a working position and does not actually clean the wafer during any horizontal movement.
  - C. Konishi does not show a first injector being perpendicular to a second injector.
  - D. The brush does not move perpendicularly with respect to a direction along which the first injector extends.
  - E. Maekawa does not include that the second injector is disposed adjacent to the brush along one side of the brush arm.

F. Maekawa does not disclose that the device has a brush that cleans the wafer during horizontal movement between a center and edges of the wafer.

G. Examiner did not supply the evidence that the first injector ejects water toward the center of the wafer.

H. Maekawa does not disclose having the brush moving perpendicularly with respect to a direction along which the first injector extends.

I. Nishimura does not disclose a device having a brush adjacent along one side of the brush arm.

J. Examiner did not supply the evidence that the first injector ejects water toward the center of the wafer.

K. Nishimura does not display that the second nozzle is perpendicular to the top surface of the wafer.

L. Nishimura does not disclose a first injector to be perpendicular to a second injector.

M. Nishimura does not disclose a brush arm moving in a direction parallel to the linear orientation of the first injector.

N. Nishimura does not disclose that the brush moves perpendicularly to a direction along which the first injector extends.

O. Nishimura does not disclose a plurality of pipe lines formed along a circumference of the brush arm.

P. Nishimura also does not disclose the first injector to be arranged perpendicular to the plurality of second injectors or that the brush arm moves in a direction parallel to the linear orientation of the first injector.

Q. Nishimura ('525) does not disclose a second injector disposed adjacent to the brush along one side of the brush arm.

R. Examiner did not supply the evidence that the first injector ejects water toward the center of the wafer.

S. It is not disclosed that Nishimura has a second nozzle perpendicular to the top surface of the wafer.

T. Nishimura does not include a brush arm moves in a direction parallel to the linear orientation of the first injector.

U. Nishimura does not disclose that the brush moves perpendicularly with respect to a direction along which the first injector extends.

V. Nishimura does not disclose that the second injectors include a plurality of pipelines formed along a circumference of the brush arm, that Nishimura does not disclose a brush arm moving in a direction parallel to the linear orientation of the first injector.

W. Traversal to 35 U.S.C. 103

***Response to Arguments***

7. Applicant's arguments A, E, F, G, H, I, J, Q, R, S, and T filed 29 August 2003 have been fully considered but they are not persuasive.

A. Adjacent is defined as close to or lying near according to The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton Mifflin Company). In Figure 2 the second injector is disposed adjacent to along one side of the brush arm.

E. Adjacent is defined as close to or lying near according to The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton Mifflin Company). In Figure 2 the second injector is disposed adjacent to along one side of the brush arm.

F. Maekawa does disclose that the device has a brush that cleans during horizontal movement (movement shown by arrows B and D). See Column 5 Lines 8-18).

G. The first injector of Maekawa ejects water toward the center of the wafer (Column 4 Line 65 to Column 5 Line 4).

H. Since the brush moves horizontally (see argument F) to clean, then it is perpendicular to the vertically arranged injectors. See Figures. (Maekawa)

I. Adjacent is defined as close to or lying near according to The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton Mifflin Company). In Figure 2 of Nishimura ('087), the injector is adjacent along one side of the brush arm.

J. In Figure 1 ('087) it is clear that the first injector ejects water toward the center of the wafer. See also Column 5 Lines 50-53.

Q. Adjacent is defined as close to or lying near according to The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton Mifflin Company). In Figure 2 of '525 the injector is adjacent along one side of the arm. Further, in Figures 10-18 the injectors are mounted within the same structure as that of the brush arm.

R. In Figures 1, 2, and 12-18, Nishimura ('525) displays that the first injector ejects water toward the center of the wafer.

S. Nishimura ('525) displays that the second nozzle is perpendicular to the top surface of the wafer in Figures 12-18.

T. As indicated above, the brush arm can move vertically. The brush arm (7) is movable in a vertical direction to keep the brush a desired distance from the surface of the wafer or in contact with the surface of the wafer (Column 6 Lines 4-10). And since the nozzles are attached to the brush arm in Figures 10-18, they inherently move in a parallel direction.

8. Applicant's arguments B, C, D, K, L, M, N, O, P, U, V, and W, see Paper No. 5, filed 29 August 2003, with respect to Konishi et al., Maekawa et al., Nishimura et al., and Nishimura et al. have been fully considered and are persuasive. The rejections under 35 U.S.C. 102 or 35 U.S.C. 103 to these particular arguments of Konishi et al., Maekawa et al., and Nishimura et al. has been withdrawn.

***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura C Cole whose telephone number is (703) 305-7279. The examiner can normally be reached on Monday-Thursday, 7am - 4:30pm, alternating Fridays. After December 17<sup>th</sup>, the Examiner's office will be located at the new USPTO site in Alexandria, Virginia. After this projected date, you may reach Examiner Laura Cole by phone at 571-272-1272 or by fax at 571-273-1272.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Warden can be reached on (703) 308-2920 (or after December 17<sup>th</sup> may be reached at 571-272-1281). The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

LCC  
LCC

20 October 2003

*Robert J. Warden, Jr.*

ROBERT J. WARDEN, SR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700